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REMARKS

Favorable consideration of this application is requested in view of the foregoing amendments and the following remarks.

The specification has been amended to clearly express which of Applicant's two groundplanes is the initial groundplane corresponding to the initial groundplanes found in the Hayafuji and Bogaty references cited by the Examiner.

Claims 1-6 are pending in the application.

Claim 1 has been amended to more clearly set forth the layer structure that is the subject of claim 1. Claims 1 and 2 have been amended to change "second groundplane" to "initial groundplane" to eliminate the possibility of any confusion that might be caused by the less clearly defining term "second groundplane". Claim 1 has also been amended to move the high bandwidth digitizer to a dependent claim.

Claims 3 to 6 have been amended so as to depend from new claim 7. New claim 7 is added by this amendment, and merely makes the high bandwidth digitizer that was formerly in claim 1 a dependent claim from claim 1. No new matter has been added.

CLAIM REJECTIONS

Claims 1, 3, & 5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Hayafuji, U.S. 4,703,256, in view of Bogaty, U.S. 5,103,161, and Takaya et al., U.S. 6,749,928.

Equivalent Structural Elements

Hayafuji, Bogaty, and Applicant have the following equivalent structural elements:

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- 1) A groundplane layer that the charged particle beam or electron beam initially passes through on its way to the Faraday Cup element (Hayafuji's metallic groundplane layer 17, Bogaty's initial groundplane 10 (also termed stripline groundplane), and Applicant's top ground layer 20 (now also referred to by this amendment as "initial groundplane" 20 to show its equivalence to Hayafuji's metallic groundplane layer 17 and Bogaty's initial groundplane 10).
- 2) A dielectric layer that the beam next passes through on its way to the Faraday Cup element (Hayafuji's electrically isolating layer 15, Bogaty's dielectric layer 9, and Applicant's dielectric layer 19).
- 3) A Faraday Cup element or beam target (Hayafuji's portion 14a of electrically conductive layer 14, Bogaty's Faraday Cup 7, and Applicant's cup or beam target 24).
- 4) A conductor connected to the Faraday Cup element for the purpose of getting the signal out to the processing circuitry (Hayafuji's conductive layer 14, Bogaty's stripline 6, and Applicant's trace 18).

Nonequivalent Structural Elements over the Beam Target

Applicant claims in claim 2 an optional conducting ring 26 located in the region of the incident beam just over the beam target 24. The conducting ring may be connected to the ground layer 20 or incorporated into an additional layer (paragraph 22, FIG. 1).

In his patent, Bogaty employs a nonoptional dielectric layer 11 and groundplane 12 in front of the initial groundplane 10 for the purpose of locating a screen 13 in the region of the incident beam just over the beam target 7.

Hayafuji mounts no additional structural elements, either optional or essential, over the beam target.

Equivalent and Nonequivalent Structural Elements Under the Beam Target

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Applicant adds a dielectric layer 17 and a groundplane 16 to the underside of the trace 18 and beam target 24, and then connects the two groundplanes 16 and 20 together for the purpose of improving the operation of the device (paragraph 23).

Like Applicant, Hayafuji employs a dielectric layer 11 on the underside of the conductive layer 14 and beam target 14a. However, Hayafuji lacks a groundplane on the underside of the conductive layer 14 and beam target 14a as Examiner notes in the Office Action. Because Hayafuji does not teach a groundplane equivalent to Applicant's groundplane 16, Examiner relies on Bogaty to supply it.

As is immediately apparent from Bogaty's specification and drawings, not only is there no groundplane on the underside of the stripline 6 and Faraday Cup 7, Bogaty does not even have the dielectric layer taught by both Hayafuji (layer 11) and Applicant (layer 17), although for different purposes.

Bogaty does teach a second groundplane 12 and dielectric layer 11, but he locates these on the opposite side of the structure immediately in front of the initial groundplane 10, as discussed earlier. Bogaty teaches no layered elements between his two groundplanes 10, 12 other than the dielectric layer 11. Unlike Applicant's teaching and claims, Bogaty's groundplanes do not encompass his stripline conductor 6 and Faraday Cup 7 at all.

In Applicant's claim 1 as currently amended, the structural elements of conductor 18, beam target 24, dielectric layer 19 and initial groundplane 20 are equivalent to structural elements found in Hayafuji and Bogaty.

Applicant's first dielectric layer 17 is the structural equivalent of Hayafuji's dielectric layer 11.

Applicant claims in amended claim 1 a groundplane (first groundplane 16) bonded to the first dielectric layer 17, both of which are located on the back side of the conducting trace 18 and beam target as is clear from the specification and FIG. 1.

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Because Hayafuji, Bogaty, and Takaya are completely silent regarding any groundplane on the backside of the conductor/beam target structure, currently amended claim 1 is patentably distinct for this reason alone.

Applicant teaches a Faraday Cup structure comprising two groundplane layers with a dielectric layer, conductor/beam target, and dielectric layer in between. Hayafuji teaches a groundplane layer and a dielectric layer with a dielectric layer and a conductor/beam target in between. Bogaty teaches a groundplane layer and a conductor/beam target with a dielectric layer, groundplane (the initial groundplane) and another dielectric in between.

Because Applicant, Hayafuji, and Bogaty all teach different Faraday Cup layer structures, and because Takaya teaches no Faraday Cup layer structure at all, Applicant's claim 1 as currently amended is patentably distinct for this reason alone.

In amended claim 1, Applicant claims the electroplated stitching of two groundplanes that have dielectric layers and a conductor/beam target in between. Hayafuji and Bogaty completely lack any teaching regarding stitching. Regarding Takaya, the Examiner states:

"Further, it would have been obvious to a person of ordinary skill in the art to use electroplating to connect the ground planes, as taught by Takaya, in the strip line Faraday Cup of Hayafuji, in order to increase connectivity between the layers."

Since Applicant has shown by this amendment that the teachings of Hayafuji and Bogaty cannot be combined to teach Applicant's groundplanes, there is no possibility that it would be obvious in any way to apply Takaya's stitching to any Hayafuji/Bogaty layer structure. Thus, Applicant's claim 1 as currently amended is patentably distinct for this reason alone.

Claim 2 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Hayafuji, Bogaty, and Takaya as applied to claim 1 above, and further in view of Cho et al., U.S. 6,300,642.

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Claims 2-7 are deemed to be patentably distinct because they depend from currently amended claim 1, a claim which Applicant deems to be allowable.

Regarding claim 2, the Examiner states that:

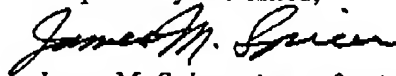
"Cho discloses a bias conducting ring 26B located at the channel 26A in the second ground plane, and a means for applying a voltage 50 (column 3, lines 50-52) to the bias conducting ring 26B."

However, Applicant finds no discussion in Cho regarding placement of his bias conducting ring in any ground plane.

Applicant thus believes that all claims are now in condition for allowance. Applicant invites the Examiner to call the undersigned if it is believed that a telephonic interview would expedite the prosecution of the application to an allowance. No fee is due for filing this Reply because it is being filed within the shortened statutory period as set in the Office Action dated April 14, 2005.

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Respectfully submitted,



James M. Spicer, Agent for Applicants
Registration No. 26,096
UT-Battelle, LLC
P. O. Box 2008, MS 6258
Oak Ridge, TN 37831
(865) 574-4180